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west virginia department of environmental protection

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## BACKGROUND INFORMATION

Application No.:	13-3257A
Plant ID No.:	095-00023
Applicant:	Jay-Bee Oil & Gas, Inc.
Facility Name:	Ketel Site
Location:	Alvy, Tyler County
NAICS Code:	211111
Application Type:	Administrative Update
Received Date:	March 16, 2017
Engineer Assigned:	Jonathan Carney
Fee Amount:	\$300.00
Date Received:	March 17, 2017
Complete Date:	April 14, 2017
Due Date:	June 7, 2017
Applicant Ad Date:	March 22, 2017
Newspaper:	Tyler Star News
UTM's:	Easting: 523.570      Northing: 4365.864      Zone: 17
Description:	Reduce facility throughput limits and consolidate emission controls from tow enclosed combustors to one enclosed combustor.

## DESCRIPTION OF PROCESS

The following description is from application number 13-3257A:

Gas produced by remote Jay-Bee wells is passed through an inlet separator, then compressed through compressors (driven by two CAT 3516B and one CAT 3608 LE engines), dehydrated in a TEG dehydration unit, metered and injected into pipelines owned and operated by others. A small portion of the dehydrated gas is used as fuel for the compressor engines and dehydration unit re-boiler. Vapors from the dehydration still vent are routed to an enclosed combustor. There is no flash tank associated with the dehydration unit. The facility was designed to process a maximum of 40 MMscfd.

Small quantities of condensate and produced water removed from the incoming raw gas stream by an inlet separator and routed to a single 210 BBL accumulation tank. In addition, water condensed through the dehydration process is also routed to this tank. The accumulated condensate is drawn off and transported via truck to an area

processing plant owned and operated by others. The produced water is transported to an approved disposal facility. An estimated maximum of 40 truckloads of condensate and produced water is transported from the facility per year.

Vapors emitted by the storage tank are routed to an enclosed combustor. There are no controls on the associated truck loading operations.

### PROPOSED CHANGES

The following changes are from application number 13-3257A:

Over time, the gas and liquids throughput at this station has decreased. Additionally, one of the two enclosed combustors is nearing the end of its useful life and requires replacement. Given these two circumstances, Jay-Bee is seeking to have both the dehydration still vent and the tank vapors controlled by a single enclosed combustor rather than separate combustors for these two waste gas streams. The consolidation to a single enclosed combustor will require the installation of a larger combustor than the ones currently in use to safely manage the combined gas flow. However, as the overall gas flow through the dehydration unit will drop from 40 MMscfd to 32 MMscfd and the volume of condensate being managed is also dropping, overall facility emissions will also drop.

Although there are no new emission sources and two of the existing emission sources are being reduced in operations (dehydration unit and produced fluids tank), operating parameters for the dehydration unit under the proposed lower flow limit will actually cause a slight increase in HAP emissions.

### SITE INSPECTION

A site inspection was performed by DEP DAQ's Compliance and Enforcement Inspector Douglas Hammell February 28, 2014. Inspector Hammell determined that the facility was in compliance.

Directions to the proposed facility are as follows:

From Clarksburg, take US Route 50 west approximately 25 miles to Route 18 north (West Union Exit). Turn right on to Route 18 (north) and travel approximately 20 miles to the community of Alma. Pass through Alma. Continue on Route 18 approximately 1 mile to the intersection with County Route 1/3 (Indian Creek Road). Turn right onto Indian Creek Road and travel 6.8 miles to a private road on the left. (Also the access road to Eureka Hunter Pipeline Tap). Proceed up this road 0.5 miles to facility on the left.



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## ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emission changes associated with this administrative amendment application consists of removal of two enclosed combustors (VCU-1 and VCU-2) and installation of a single larger combustor (VCU-3) that will control emissions from both the dehydrator still vent and tank vapors.

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type and Date of Change	Control Device
CE-1	1E	Residue Gas Compressor Engine (Caterpillar 3516 B)	2013	1380 hp	Existing	1C (SCR)
CE-2	2E	Residue Gas Compressor Engine (Caterpillar 3516 B)	2013	1380 hp	Existing	2C (SCR)
CE-3	3E	Residue Gas Compressor Engine (Caterpillar 3516 B)	2013	1380 hp	Previously Removed	3C (SCR)
CE-4	4E	Residue Gas Compressor Engine Residue Gas Compressor Engine (Caterpillar 3606 LE)	2016	1775 hp	Existing	4C (SCR)
RSV-1	9E	Dehy Still	2013	40 MMscfd	Existing	VCU-3
RBV-1	6E	Dehydration Unit Re-Boiler	2013	0.75 MMBtu/hr	Existing	None
T05	9E	Produced Fluids Tank	2015	210 bbl	Existing	VCU-3
TL-1	8E	Truck Loading	2015	140,000 gallons/yr	Existing	None
---	---	Fugitive VOC Emissions-Fittings and Connections	2014	N/A	Existing	None
---	---	Haul Roads	2014	1 Truck per day max.	Existing	None

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Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed/Modified	Design Capacity	Type and Date of Change	Control Device
VCU-3	9E	Enclosed Combustor (Controlling Dehydration Unit Still Vent and Produced Liquids Tank 05)	2017	10.0 MMBtu/hr	New	None

Maximum controlled point source emissions from the revised changes were calculated by SWN Production and checked for accuracy by the writer and are summarized in the table below.

Emission Point ID	Emission Unit ID	Process Unit	Pollutant	Maximum Controlled Emission Rate	
				Hourly (lb/hr)	Annual (ton/year)
CE-1	1E	Residue Gas Compressor Engine (Caterpillar 3516 B)	Nitrogen Oxides	1.52	6.66
			Carbon Monoxide	0.61	2.67
			Sulfur Dioxide	0.01	0.03
			Particulate Matter-10	0.11	0.50
			Volatile Organic Compounds	0.88	3.86
			Formaldehyde	0.307	1.34
			Total HAPs	0.513	2.25
			Carbon Dioxide Equivalent	1,750.1	7,665
CE-2	2E	Residue Gas Compressor Engine (Caterpillar 3516 B)	Nitrogen Oxides	1.52	6.66
			Carbon Monoxide	0.61	2.67
			Sulfur Dioxide	0.01	0.03
			Particulate Matter-10	0.11	0.50
			Volatile Organic Compounds	0.88	3.86
			Formaldehyde	0.307	1.34
			Total HAPs	0.513	2.25
			Carbon Dioxide Equivalent	1,750.1	7,665

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Emission Point ID	Emission Unit ID	Process Unit	Pollutant	Maximum Controlled Emission Rate	
				Hourly (lb/hr)	Annual (ton/year)
CE-3	3E	Residue Gas Compressor Engine (Caterpillar 3516 B)	Nitrogen Oxides	<0.01	<0.01
			Carbon Monoxide	<0.01	<0.01
			Sulfur Dioxide	<0.01	<0.01
			Particulate Matter-10	<0.01	<0.01
			Volatile Organic Compounds	<0.01	<0.01
			Formaldehyde	<0.01	<0.01
			Total HAPs		
			Carbon Dioxide Equivalent	<0.00	<0.00
CE-4	4E	Residue Gas Compressor Engine Residue Gas Compressor Engine (Caterpillar 3606 LE)	Nitrogen Oxides	1.96	8.57
			Carbon Monoxide	0.75	3.30
			Sulfur Dioxide	0.01	0.04
			Particulate Matter-10	0.13	0.59
			Volatile Organic Compounds	1.66	7.28
			Formaldehyde	0.24	1.07
			Total HAPs	0.49	2.15
			Carbon Dioxide Equivalent	2,144.3	9,392
RBV-1	6E	Dehydration Unit Re-Boiler	Nitrogen Oxides	0.08	0.33
			Carbon Monoxide	0.06	0.28
			Volatile Organic Compounds	<0.01	0.02
			n-Hexane	<0.01	0.01
			Benzene	<0.01	<0.01
			Carbon Dioxide Equivalent	90.6	397
TL-1	8E	Truck Loading	Volatile Organic Compounds	-	0.01

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Emission Point ID	Emission Unit ID	Process Unit	Pollutant	Maximum Controlled Emission Rate	
				Hourly (lb/hr)	Annual (ton/year)
VCU-3	9E	Enclosed Combustor (Controlling Dehydration Unit Still Vent and Produced Liquids Tank 05)	Nitrogen Oxides	0.30	1.30
			Carbon Monoxide	0.25	1.12
			Particulate Matter-10	0.02	0.10
			Volatile Organic Compounds	1.44	6.32
			Total HAPs	0.43	1.88
			Carbon Dioxide Equivalent	453.2	1986.19
			n-Hexane	0.03	0.14
			Benzene	0.13	0.55
			Toluene	0.18	0.77
			Ethylbenzene	0.01	0.05
			Xylene	0.08	0.37

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## REGULATORY APPLICABILITY

### **45 CSR 13 (Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation)**

The changes in the control equipment at the facility results in a increase of hazardous air pollutants. Such an increase requires a Class II administrative update.

As required under §45-13-8.3 ("Notice Level A"), Jay-Bee Oil & Gas, Inc. placed a Class I legal advertisement in a "newspaper of *general circulation* in the area where the source is . . . located." The ad ran on March 22, 2017 in the *Tyler Star News* and the affidavit of publication for this legal advertisement was submitted on May 1, 2017. The application fee of \$300 was received on March 17, 2017.

The applicability of rules and regulations to this facility have not changed as a result of the proposed changes in this administrative update.

## TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows or suspects may cause cancer or other serious human health effects. The Station is classified as an area source of hazardous air pollutants. Listed below is a description of the primary hazardous air pollutants for this facility.

### **Benzene**

Benzene is found in the air from emissions from burning coal and oil, gasoline service stations, and motor vehicle exhaust. Acute (short-term) inhalation exposure of humans to benzene may cause drowsiness, dizziness, headaches, as well as eye, skin, and respiratory tract irritation, and, at high levels, unconsciousness. Chronic (long-term) inhalation exposure has caused various disorders in the blood, including reduced numbers of red blood cells and aplastic anemia, in occupational settings. Reproductive effects have been reported for women exposed by inhalation to high levels, and adverse effects on the developing fetus have been observed in animal tests. Increased incidence of leukemia (cancer of the tissues that form white blood cells) have been observed in humans occupationally exposed to benzene. EPA has classified benzene as a Group A, human carcinogen.

### **Toluene**

The acute toxicity of toluene is low. Toluene may cause eye, skin, and respiratory tract irritation. Short-term exposure to high concentrations of toluene (e.g., 600 ppm) may produce fatigue, dizziness, headaches, loss of coordination, nausea, and stupor; 10,000 ppm may cause death from respiratory failure. Ingestion of toluene may cause nausea and vomiting and central nervous system depression. Contact of liquid toluene with the

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eyes causes temporary irritation. Toluene is a skin irritant and may cause redness and pain when trapped beneath clothing or shoes; prolonged or repeated contact with toluene may result in dry and cracked skin. Because of its odor and irritant effects, toluene is regarded as having good warning properties. The chronic effects of exposure to toluene are much less severe than those of benzene. No carcinogenic effects were reported in animal studies. Equivocal results were obtained in studies to determine developmental effects in animals. Toluene was not observed to be mutagenic in standard studies.

### **Ethylbenzene**

Ethyl benzene is mainly used in the manufacturing of styrene. Acute (short-term) exposure to ethyl benzene in humans results in respiratory effects, such as throat irritation and chest constriction, irritation of the eyes, and neurological effects, such as dizziness. Chronic (long-term) exposure to ethyl benzene by inhalation in humans has shown conflicting results regarding its effects on the blood. Animal studies have reported effects on the blood, liver, and kidneys from chronic inhalation exposure to ethyl benzene. Limited information is available on the carcinogenic effects of ethyl benzene in humans. In a study by the National Toxicology Program (NTP), exposure to ethyl benzene by inhalation resulted in an increased incidence of kidney and testicular tumors in rats, and lung and liver tumors in mice. EPA has classified ethyl benzene as a Group D, not classifiable as to human carcinogenicity.

### **Xylenes**

Commercial or mixed xylene usually contains about 40-65% m-xylene and up to 20% each of o-xylene and p-xylene and ethyl benzene. Xylenes are released into the atmosphere as fugitive emissions from industrial sources, from auto exhaust, and through volatilization from their use as solvents. Acute (short-term) inhalation exposure to mixed xylenes in humans results in irritation of the eyes, nose, and throat, gastrointestinal effects, eye irritation, and neurological effects. Chronic (long-term) inhalation exposure of humans to mixed xylenes results primarily in central nervous system (CNS) effects, such as headache, dizziness, fatigue, tremors, and incoordination; respiratory, cardiovascular, and kidney effects have also been reported. EPA has classified mixed xylenes as a Group D, not classifiable as to human carcinogenicity. Mixed xylenes are used in the production of ethylbenzene, as solvents in products such as paints and coatings, and are blended into gasoline.

### **Formaldehyde**

Formaldehyde is used mainly to produce resins used in particle board products and as an intermediate in the synthesis of other chemicals. Exposure to formaldehyde may occur by breathing contaminated indoor air, tobacco smoke, or ambient urban air. Acute (short-term) and chronic (long-term) inhalation exposure to formaldehyde in humans can result in respiratory symptoms, and eye, nose, and throat irritation. Limited human studies have reported an association between formaldehyde exposure and lung and nasopharyngeal cancer. Animal inhalation studies have reported an increased

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incidence of nasal squamous cell cancer. EPA considers formaldehyde a probable human carcinogen (Group B1).

All HAPs have other non-carcinogenic chronic and acute effects. These adverse health effects may be associated with a wide range of ambient concentrations and exposure times and are influenced by source-specific characteristics such as emission rates and local meteorological conditions. Health impacts are also dependent on multiple factors that affect variability in humans such as genetics, age, health status (e.g., the presence of pre-existing disease) and lifestyle. As stated previously, *there are no federal or state ambient air quality standards for these specific chemicals*. For a complete discussion of the known health effects of each compound refer to the IRIS database located at [www.epa.gov/iris](http://www.epa.gov/iris).

### AIR QUALITY IMPACT ANALYSIS

Modeling was not required of this source due to the fact that the facility is not subject to 45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants) or 45CSR19 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution which Cause or Contribute to Nonattainment) as seen in the table listed in the Regulatory Discussion section under 45CSR14/45CSR19.

### MONITORING OF OPERATIONS

No changes to monitoring of operations are included.

### CHANGES TO PERMIT R13-3257

Removed VCU-1 and VCU-2 from Section 1.0 Emission Units Table.

Decreased throughput limit in Section 6.1.1.

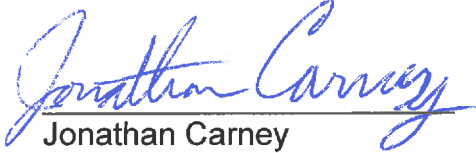
Changed the combustor emission unit in section 6.1.4 from VCU-1 to VCU-3 and in section 7.0 from VCU-2 to VCU-3. The corresponding emission limits were have been changed based on 95% control efficiency.

Minimum control efficiency in section 6.1.8 and 7.1.5 have been changed from 98% to 95%.

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## RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that the Jay-Bee Oil & Gas, Inc. natural gas production facility should meet all the requirements of applicable rules and regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that the Tyler County location should be granted a 45CSR13 Administrative Update for their facility.



Jonathan Carney  
Permit Writer



DATE

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